

- HAVE OUT HW

- Complete #25 on page 557 as a warm up

25)

(a) upper tail (looking ABOVE the claim)

(b) saying the stands can hold more than 500 lbs, when they really can't

(c) Saying the stands can not hold more than 500 lbs when they really can

HOMEWORK: p. 554

(2) (a) 2.365 (b) 2.626 (c) 0.9829 (d) 0.0381

(4) As df increases, the t^* decreases.

(14) $n = 44$, $df = 43$, $\bar{x} = \$126$, $s = \$15$

(a) Conditions:

- | | |
|---------------------------------|--|
| - SRS | - assumed random |
| - pop $\geq 10n$ | - there are more than 440 daily parking fees collected total |
| - normal pop.
or $n \geq 30$ | - $n = 44 \geq 30$ |

Conditions met \Rightarrow Student's t-distribution \Rightarrow 1 sample t-int

(b) $\bar{x} \pm t^* \frac{s}{\sqrt{n}} = (122.2, 129.8)$

(c) We are 90% confident that the true average daily fee collected is between \$122.20 and \$129.80.

(d) In repeated samplings of the same size ($n=44$), 90% of the confidence intervals created will catch the true average daily fee.

(e) claim = \$130

Since the entire interval is below \$130, I do not believe that the claim of \$130 is correct. In fact, I am 90% confident that the true average value is below \$130.

(37) (a) Conditions:

1 - SRS

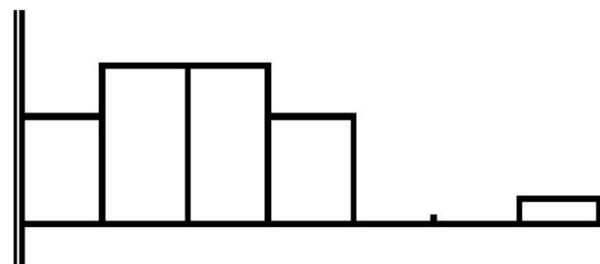
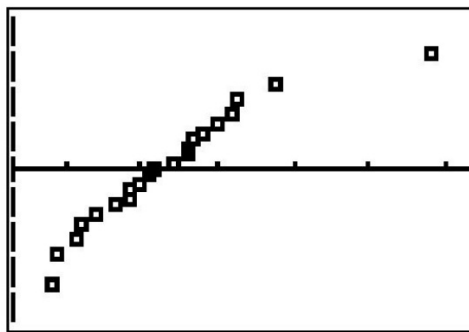
2 - $\text{pop} \geq 10n$

3 - normal pop.
or $n \geq 30$

1 - assumed random

2 - there are more than 200 tests of the
maze

3 - normal prob. plot and/or histogram:



Conditions met? possibly. There is an outlier.

(b) $H_0: \mu = 60$	$\bar{x} = 52.21$	$s = 13.56$
$H_a: \mu \neq 60$	$n = 21$	$df = 20$

$$t = \frac{\bar{x} - \mu}{s/\sqrt{n}} = -2.632$$

$$2 * P(t < -2.632 | df = 20) = 0.016$$

- We reject H_0 b/c p-value is less than $\alpha = 0.05$.
- We have sufficient evidence that the true average time to complete the maze is not equal to 60 seconds.

(c) eliminating outlier:

$$\bar{x} = 50.13$$
$$n = 20$$

$$s = 9.904$$
$$df = 19$$

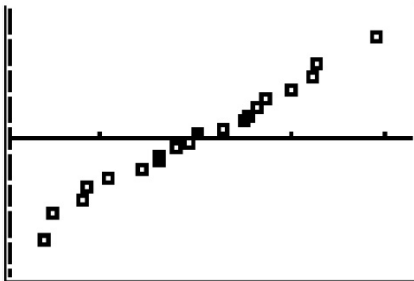
Hypotheses:

$$H_0: \mu = 60$$

$$H_a: \mu \neq 60$$

Conditions:

MET! Use Student's t-distribution, and 1-sample t-test



$$t = \frac{\bar{x} - \mu}{s/\sqrt{n}} = -4.457$$

$$2 * P(t < -4.457 \mid df=19) = 2.705 \times 10^{-4} = 0.0002705$$

- We reject H_0 b/c p-value of $0.0002705 < \alpha = 0.05$.
- We have sufficient evidence that the true average time to complete the maze is not 60 seconds.

Without the outlier, there is very strong evidence (very low p-value) against H_0 .

(d) Due to the low p-value, we do not believe the claim that the maze takes an average of 1 minute to complete.

* FORMULA SHEET!

- * Using info in #31 on page 557, and ONLY the formula sheet:
 - (1) Perform a test of significance to see if the bags are being over-filled.
 - (2) Estimate with 95% confidence the true average weight in the bags.

31)

(a) $H_0: \mu = 28.3$
 $H_a: \mu > 28.3$

2

Conditions:

1) SRS

1) assumed random sample

6

2) $pop \geq 10n$

2) there are more than 60 bags of potato chips

3) normal pop
or $n \geq 30$

3) Normal probability plot shows a straight line, so the sampling distribution is approx. normal

Conditions met \Rightarrow can use Student's t-distribution \Rightarrow
1-sample t-Test

3

$$t = \frac{\bar{x} - \mu}{s/\sqrt{n}} = 2.945$$

3

$P(t > 2.945 \mid df = 5) = 0.016$

3

- We reject our H_0 b/c p-value of $0.016 < \alpha = 0.05$.
- We have sufficient evidence that the true average weight of the bags is greater than 28.3 grams.

4

Conditions met in test of significance => we can use a
1-sample T-Interval 1

$$\bar{x} \pm t^* \frac{s}{\sqrt{n}} = (28.361, 29.205)$$

3

We are 95% confident that the true average weight of the bags
of chips is between 28.361 and 29.205 grams. 3